TABLE 6-1

PHYSICOCHEMICAL CHARACTERISTICS OF CHEMICALS OF CONCERN

	CAS #	OSHA PEL	ACGIH TLV/ Recommended Exposure Limits	IDLH	Vapor Pressure	Specific Gravity	Skin Hazard	Odor Threshold	Carcinogen Category	OVA % (Methane) Response	MW
					mm @ 68 F	@ 68 F					grams
Lead (inorganic)	7439-92-1	0.05 mg/m³	0.15 mg/m³	700 mg/m³	0.04	11.34	NO	~odorless	IRIS B2	NA	207
Magnesium (dust)	1309-48-4	10 mg/m³ T 5 mg/m³ R	10 mg/m³	NE	~0	3.58	NO		NE	NA	40.3
Manganese	7439-96-5	5 mg/m³ C	0.2 mg/m³ (a) 5 mg/m³	NE	0.029	7.2	NO		IRIS D	NA	54.9
Mercury (organo) alkyl compounds (as Hg)	7439-97-6	0.01 mg/m³ 0.03 mg/m³ S	0.01 mg/m³ 0.03 mg/m³ S	10 mg/m³	varies	varies	YES		IRIS D	NA	
Methyl Naphthalene 2-	91-57-6	0.2 mg/m³ (b)	0.2 mg/m³ (b)	NE	3.1	1.01 @ 20C	NO	0.01 - 0.05 ppm	NE		142.2
Methylene Chloride	75-09-2	25 ppm 125 ppm S	50 ppm	5000 ppm	350	1.33	NO	sweet, pleasant 160 - 307 ppm	IRIS B2	90	84.9
Methylphenol 2-	95-48-7	NE	NE		0.21						108.14
Methylphenol 4-	106-44-5	NE	NE		0.097						108.14
Naphthalene	91-20-3	10 ppm 15 ppm S	10 ppm 15 ppm S	500 ppm	0.08	1.15	NO	Odor fo mothballs		NA	128.2
Nickel (soluble salts)	7440-02-0	1 mg/m³	1 mg/m³ 0.05 mg/m³ (a)		0.02	8.9	NO		IRIS A1 (refinery dust)	NA	58.69
Nitrophenol 4-	100-02-7	NE	NE		0.5	1.27	YES	~odorless	NE	NA	139.11
Octyl Phthtalate di-n-	117-84-0	NE	NE	NE	0.05	0.973 @ 25 C	NE		NE	NA	390.56
Phenanthrene	85-01-8	0.2 mg/m³ (b)	0.2 mg/m³ (b)	NE	0.28	0.98 @4C	YES	faint, aromatic	IRIS D	NA	178.22
Phenol	108-95-2	5 ppm	5 ppm	250 ppm	0.4	1.06	YES	sweet aromatic 0.05 - 16.4 ppm	IRIS D	54	94.1
Potassium (dust)	7440-09-7	10 mg/m³ T 5 mg/m³ R	10 mg/m³	NE	0.11	0.86				NA	39.1
Pyrene (Benzo(d,e,f)phenanthrene)	129-00-0	0.2 mg/m³ (b)	0.2 mg/m³ (b)	NE	0.43	1.271 @ 23 C	YES		IRIS D	NA	202.26
Tetrachlorodibenzo-p-dioxin 2,3,7,8-	1746-01-6	NE	NE	NE	6.40E-10		YES		IARC B2	NA	321.96
Tin (soluable)	7440-31-5	2 mg/m³	2 mg/m³	400 mg/m³	0.03	7.28	YES			NA	118.69
Toluene	108-88-3	100 ppm 150 ppm S	50 ppm	2000 ppm	21	0.87	YES	sweet pungent 2.14 ppm	IRIS D	110	92
Trichlorobenzene 1,2,4-	120-82-1	5 ppm C	5 ppm C	NE	0.26	1.45	YES	Aromatic 3 ppm	IRIS D	100	181.46
Trichlorophenol 2,4,6-	88-06-6	NE	NE		0.4						197.45
Vanadium	1314-62-1	0.05 mg/m³	0.05 mg/m³	70 mg/m³	~0	3.36	NO		NE	NA	181.88
Xylene, all isomers	1330-20-7	100 ppm 150 ppm S	100 ppm 150 ppm S	1000 ppm	9	NA	NO	aromatic	IRIS D	NE	106.2
Xylene, m-	106-42-3	100 ppm 150 ppm S	100 ppm 150 ppm S	1000 ppm	9	0.86	NO	aromatic	IRIS D	111	106.2
Xylene, o-											
Xylene, p-	108-38-3	100 ppm 150 ppm S	100 ppm 150 ppm S	1000 ppm	9	0.86	NO	aromatic	IRIS D	116	106.2
Zinc Oxide Dust	1314-13-2	10 mg/m³ T 5 mg/m³ R	10 mg/m³	NE	~0		NO		IRIS D	NA	81.4

TABLE 6-1

PHYSICOCHEMICAL CHARACTERISTICS OF CHEMICALS OF CONCERN

	CAS #	OSHA PEL	ACGIH TLV/ Recommended Exposure Limits	IDLH	Vapor Pressure	Specific Gravity	Skin Hazard	Odor Threshold	Carcinogen Category	OVA % (Methane) Response	MW
					mm @ 68 F	@ 68 F					grams
Zinc Oxide Fume	1314-13-2	5 mg/m³ 10 mg/m³ S	5 mg/m³ 10 mg/m³ S	NE	~0	5.61	NO		IRIS D	NA	81.4

NOTES:

a	These TLVs have not yet been adopted. ACGIH has placed them under notice of intended changes.
ACGIH	American Conference of Governmental Industrial Hygienists
b	This PEL/TLV is for all Coal Tar Pitch Volatiles combined. Separate PEL/TLVs have not been established to date.
C	Ceiling Limit, shall not be exceeded at any time during the work day.
CAS #	Chemical Abstracts Service Registry Number
D	Contaminant intake that should not induce adverse effects to human health or should not pose a risk of cancer occurrence greater than a predetermined risk level.
	Developed by U.S. Army Medical Bioengineering R&D Laboratory. Expressed in mg/kg/day.
IARC	International Agency for Research on Cancer
IDLH	Immediately Dangerous to Life or Health
IRIS	Integrated Risk Information System
MW	Molecular weight
mg/m³	milligrams of contaminant per cubic meter of air
NA	Not Applicable
NE	Not Established
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit, unless noted is the TWA, Time Weighted Average (usually for 8 hours a day, 5 days a week), mandated by law (1989 standards)
ppm	parts of contaminant per million parts of air
R	Respirable Dust
S	Short Term Exposure Limit (STEL) usually 15 minutes, four times in one day
S/5/2	STEL for 5 minutes, twice per day
Skin Hazard	Contaminant can be absorbed through intact skin.
T	Total Dust
TLV	Threshold Limit Value, unless noted is the TWA, Time Weighted Average (usually for 8 hours a day, 5 days a week), recommended

Carcinogenic Category

IRIS	IARC	
A	1	Human Carcinogen
B1		Probable Human Carcinogen (limited human data)
	2A	
B2		Probable Human Carcinogen (sufficient in animals, inadequate evidence in humans).
	2B	
C	3	Possible Human Carcinogen
D	4	Not Classifiable
E		Evidence of Non-Carcinogen

7.0
GENERAL HEALTH AND SAFETY REQUIREMENTS

7.1 MEDICAL SURVEILLANCE PROGRAM

Before commencing any of the activities defined in Section 5.0, all personnel must have taken an approved entry medical examination and periodic medical examinations as required by OSHA requirements of 29 CFR 1910.120(f). Subcontractors involved in field activities must provide documentation of medical examinations for their employees. Medical surveillance is a major component of this health and safety program to monitor and promote the health of employees engaged in projects which have the potential for exposure to hazardous substances.

Exposure to chemicals in toxic concentrations has the potential to cause adverse health effects although the use of recognized safety procedures and protective equipment substantially mitigates associated risks. In the event a potentially harmful exposure occurs, early detection of symptoms is extremely important to successful treatment. Thus, the medical surveillance procedures prescribed as part of this health and safety program must be followed by all relevant personnel without exception.

Medical surveillance provides a clinical base of information that is used to evaluate an employee's fitness to work on a hazardous waste site, to identify anomalies in a person's medical history that may be related to potential impaired health, and to evaluate a person's capability to use respiratory protective equipment. This base of medical information includes personnel health history, exposure history, physical examination results, laboratory analyses, and results of screening and special tests.

Medical examinations will include the following:

- Past medical history - on entry to the program, information concerning past occupational and personal as well as family history of disease

- Present medical profile - all pertinent medical information regarding present state of health and during each year of field work in hazardous material projects

- Exposure history - information concerning the cumulative duration of time spent on potentially hazardous sites, the primary toxic substances, and the levels of protection employed by each site

- Kidney and Liver function tests - possible exposure to aromatic hydrocarbons, herbicides, and organochlorine insecticides warrant examination of the liver enzymes and blood exams to evaluate kidney and liver function

- Hematology - complete blood-forming function exams including: Complete Blood Count, White Blood Count, Red Blood Count and Hemoglobin exams as part of the Medical Exam due to the potential for exposure to benzene, DDT and lead

- Urinalysis - the possible exposure to lead and herbicides require biological monitoring for lead and trace herbicides in urine

- Physical examination

- Hearing test

- Vision test

- Pulmonary function test

Optional tests, if recommended by the examining physician, include:

- Electrocardiogram
- X-ray
- Special tests - medical information concerning the effects of exposure to specific contaminants

7.2 TRAINING

All personnel engaged in field operations involved with the Site are required to participate in a 40-hour OSHA HAZWOPPER and the 8-hour annual refresher course (if appropriate) that meets the requirements stipulated under 29 CFR 1910.120. All supervisors must also have an 8-hour hazardous waste course for supervisors, as per 29 CFR 1910.120 requirements. All site personnel functioning independently of an immediate supervisor shall have a minimum of three days of actual field experience under a skilled supervisor. Contractors must provide documentation and certificates to the SSO indicating that they have successfully completed all the training requirements stipulated under 29 CFR 1910.120 and/or 29 CFR 1926. **An individual that either refuses to or cannot produce a record of course completion will be prohibited from participation in field activities.**

At a minimum one person, the SSO, will be CPR/First Aid Trained and Certified. Any other personnel certified to do CPR/First Aid will be identified during the daily site safety meetings.

Visitors entering the exclusion zone will be required to provide proper documentation indicating that the individual has successfully completed a 40-hour or 24-hour Health and Safety Course for

Hazardous Waste Site Work. The course requirements are outlined in 29 CFR 1910.120 of the Federal Register. In addition, the individual must provide documentation indicating that he or she has taken a medical examination covering the basic requirements outlined in Section 7.1.

7.3 HEALTH AND SAFETY INCIDENT REPORTING

Any incident or accident involving field personnel will require that a Health and Safety Incident Report be filed. Situations covered by this include, but are not limited to, fires, explosions, illnesses, injuries, and automobile accidents. These reports must be sent to the Facility Coordinator and the HSO within 24 hours of the incident/accident. Worker's Compensation Insurance reports should be filed with the individual's employer within 48 hours of each accident or illness that results from work-related activities and requires medical attention. See Attachment D for an example of the Health and Safety Incident Report form. The SSO will complete this form in case of an accident or incident. The Facility Coordinator and the HSO should be verbally notified of any incident or accident as soon as possible.

7.4 COMPLIANCE AGREEMENT

The Site Manager and/or the SSO will hold meetings with field personnel before work commences. Prior to or during the meetings, all personnel will be provided with a copy of this HASCP; the plan will be reviewed and discussed and questions answered; and fit testing and care of respirators will be reviewed. Signed Compliance Agreement forms will be collected by the Site Manager and filed. Attachment A contains the HASCP Compliance Agreement Form. Individuals refusing to sign the form will not be allowed to work on Site. Subcontractor personnel or other companies involved in field activities at the Site are required to meet the requirements of this HASCP as a minimum. However, they are separately responsible for enforcement and/or modification of safety measures applied to their employees.

7.5 RESPIRATOR MAINTENANCE

Respirators will be cleaned daily according to procedures prescribed by the manufacturer. Combination cartridges will be used and replaced either daily or if breakthrough is detected at any time while in use. Negative and positive pressure tests will be performed daily on each individual respirator. The following checks will be performed on a daily basis in addition to the above:

- Exhalation valve - pull off plastic cover and check valve for debris or for tears in the neoprene valve (which could cause leakage).

- Inhalation valves (two) - screw off cartridges and visually inspect neoprene valves for tears. Make sure that the inhalation valves and cartridge receptacle gaskets are in place.

- Make sure you have the right cartridge, combination organic vapor (not more than 1000 ppm) and High Efficiency Particulate Air (HEPA) filter cartridge (dust, mist, fumes, asbestos and radionuclides with a Time Weighted Average (TWA) less than 0.05 mg/m^3).

- Make sure that the face piece harness is not damaged. The serrated portion of the harness can fragment which will prevent proper face seal adjustment.

- Make sure the speaking diaphragm retainer ring is hand tight.

The SSO shall oversee the respirator maintenance program, including documentation of Self-Contained Breathing Apparatus (SCBA) maintenance and repair.

7.6 PROJECT HEALTH AND SAFETY SUMMARY REPORT

A project Health and Safety Summary Report will be used to record entry and exit dates and times of all personnel and of project Site visitors; accidents, injuries, and illnesses; incidences of safety infractions by field personnel; air quality and personal exposure monitoring data; and other information related to safety matters. All accidents, illnesses, or other incidences will be reported to the Project Manager, to the Facility Coordinator, and to the HSO. A copy of the Health and Safety Summary Report form for this project is presented in Attachment E.

7.7 SITE SAFETY MEETING

During field operations, an initial site orientation meeting will be held by the SSO to review and plan specific health and safety aspects of scheduled work. Potential subjects to be discussed are presented below:

1. Preliminary

   - Medical clearances for all participants
   - Written HASCP availability (copies provided to all participants)
   - PPE and decontamination equipment availability for checkout, demonstration and fit testing (if necessary)

2. Training topics

   - Delineation of on-Site personnel responsibilities
   - Review of HASCP including:

- types of hazards
- pathways of exposure
- levels of protection
- symptoms and signs of over-exposure to COCs
- contamination avoidance
- physical hazards
- decontamination
- emergency procedures and incident notification
- specific on-Site area/work tasks of concern
- decontamination review including:
  - delineation of work zones
  - set-up and dry run of decontamination equipment
- personnel protective clothing - use and dress out procedures
- monitoring equipment review

C Questions and answers

C Signing and completion of HASCP Compliance Agreement

7.8 HAZARD COMMUNICATION PROGRAM

Compliance with the requirements of OSHA's Hazard Communication Standard is required for work at this Site. The SSO is responsible for maintaining a Material Safety Data Sheet (MSDS) for any hazardous materials brought to the Site. Personnel shall receive training for safe use of these materials (as required by 29 CFR 1910.1200) during Site safety meetings.

MSDS sheets for the COCs are available from the HSO. Presentation of the required administrative, engineering and PPE controls required to conduct work at this Site are considered the training requirements for working safely with the COCs.

7.9 OSHA INFORMATION POSTER

In accordance with the Occupational Safety and Health Act of 1970, a copy of the OSHA information poster must be present on all sites. This poster is appended as Attachment F. It should be posted at full size (11 in x 17 in) in the personnel unit.

7.10 RECORDKEEPING

A log of daily activities shall be maintained by the SSO. The log shall include a record of project-related site visitors entering the exclusion zone. A record of persons authorized to work in the exclusion zone shall also be maintained.

8.0
SITE SPECIFIC HEALTH AND SAFETY REQUIREMENTS

8.1 PERSONAL PROTECTIVE EQUIPMENT

The PPE specified in this plan will be made available to all field personnel. The following requirements are in accordance with OSHA regulations:

- Facial hair that interferes with proper fit of respirators must not be worn.
- Contact lenses must not be worn.
- Eyeglasses that interfere with proper fit to full-face respirators must not be worn.

8.1.1 Levels of Protection

Level D Personal Protective Equipment

- Hard hat (if overhead hazard exists)
- Boots with steel-toe and steel shank (as required by the SSO)
- Safety Glasses (as required by the SSO)
- Class III Personal Flotation Device (when working over water)

Modified Level D Personal Protective Equipment

- Hard hat (if overhead hazard exists)
- Nitrile - butadiene rubber outer gloves
- Latex or vinyl surgical gloves (to be worn underneath outer gloves and taped to Tyvek)

- Saranex, or equivalent splash suit, coveralls shall be worn when there is a reasonable potential for contact with the river sediment or soils
- Polyvinyl chloride (PVC) or rubber boots with steel-toe and steel shank
- Safety Glasses (as required by the SSO)
- Class III Personal Flotation Device (when working over water)
- Regular Tyvek, or equivalent, disposable inner "booties"
- Regular Tyvek, or equivalent, inner coveralls (taped or otherwise connected to "booties")

Level C Personal Protective Equipment

- Hard hat (if overhead hazards exist, secured by duct tape)
- Full-face respirator
- Nitrile - butadiene rubber outer gloves
- Latex or vinyl surgical gloves (to be worn underneath outer gloves and taped to Tyvek)
- Saranex, or equivalent splash suit, hooded outer coveralls
- PVC or rubber boots with steel-toe and steel shank
- Regular Tyvek, or equivalent, disposable inner "booties"
- Regular Tyvek, or equivalent, inner coveralls (taped or otherwise connected to "booties")
- Class III Personal Flotation Device (when working over water)

Level B Personal Protective Equipment

- Hard hat (if overhead hazards exist, secured by duct tape)
- Supplied air respirator (5-minute ELSA escape bottles required with airline equipment)
- Nitrile - butadiene rubber outer gloves
- Latex or vinyl surgical gloves (to be worn underneath outer gloves)

- Regular Tyvek, or equivalent, disposable inner "booties"
- Saranex, or equivalent, hooded outer coveralls (taped at cuffs, zipper and respirator)
- PVC or rubber boots with steel-toe and steel shank
- Regular Tyvek, or equivalent, inner coveralls
- Class III Personal Flotation Device (when working over water)

8.1.2 Task-Specific Initial Levels of Protection

The initial levels of protection shall be as follows:

Task 1A	(Core Sample Collection) The pilot for core sample collection vessel may start work in Level D if he/she is working from within an enclosed cabin. The cabin area must be monitored during core sample collection to determine whether PPE upgrade is required.	Level D/Modified Level D*
Task 1B	(Support Launch)	Modified Level D
Task 1C	(Core Processing)	Level C
Task 1D	(Core Sample Storage)	Level D
Task 1E	(Geotechnical Testing)	Level C (no downgrade allowed)
Task 2	(Bathymetry)	Level D
Task 3A	(Acoustic Doppler)	Level D
Task 3B	(Collection of Suspended Sediment)	Level D/C**
Task 3C	(Collection of Bed Load Samples)	Level D/C**
Task 4	(Cone Penetrometer Testing/Electric Vane Testing)	Level D

Entering the Exclusion Zone at 80/120 Lister Avenue	Level C
Equipment Decontamination	Level C

Donning and doffing of PPE during this project may be conducted on the boat without returning to the decontamination station (see Section 8.5.1.2).

* During this activity, individuals not working directly with the core or sampling equipment may perform work in Level D. Those individuals working directly with the core and the designated SSO may perform work in Modified Level D. The SSO and personnel working directly with the core must be prepared to upgrade to Level C based on action levels.

** During this activity, sample handling personnel may initiate work in Level D while wearing nitrile-butadiene rubber gloves. The SSO or his\her designee will monitor employee exposure levels during these operations with an FID or equivalent. The SSO and personnel working directly with the sampling equipment must be prepared to upgrade to Level C based on action levels.

Specific action levels for upgrades and downgrades are given in Section 8.3.

8.2 AIR QUALITY MONITORING

Periodic monitoring will be conducted within the breathing zone of site personnel during all intrusive activities or when there is a potential for exposure to chemicals of concern. During these activities, the following will be utilized to monitor air quality:

- Flame Ionization Detector

  A Flame ionization (FID) or equivalent will be used to detect trace concentrations of certain organic gases and a few inorganic gases in the air. The major components of air are not detected by a FID. The FID probe was selected for this project due to its specificity for the group of contaminants of concern at the site. It should be kept in mind that the FID detects mixtures of compounds simultaneously, and readings do not indicate concentrations of any individual compound when a mixture of compounds is present. The FID is a real-time instrument that will be used to document airborne concentrations of organic vapors within its sampling/analytical limitations.

  The FID will be calibrated daily using a 10 ppm methane standard for calibration. Calibrations will be documented. While calibrating the instrument, it will not be adjusted to the background levels; however, the sampling results will be compared to the initial background levels taken prior to the start of work. FID readings will be checked in the breathing zone of the most highly exposed worker (i.e., closest to the source). The FID will be maintained and used in accordance with manufacturer's operation manuals and field procedures.

- Benzene Draeger Tubes

  If airborne concentrations exceed the action level for upgrade to level C according to readings on the FID (i.e., greater than 2 ppm), personnel shall upgrade PPE.

Samples shall then be collected to screen for benzene exposure. Sampling shall be conducted with a Draeger Tube® 6728561 or the equivalent. The frequency of monitoring thereafter shall be determined by the SSO based on site conditions and work activities. Samples must be collected frequently enough to determine personnel exposures if airborne concentrations continue to exceed FID action levels.

C Integrated Sampling

If sampling with benzene tubes indicates that benzene concentrations are over the OSHA action level for benzene (0.5 ppm), integrated samples shall be collected in the breathing zone of personnel with the greatest potential for exposure. Monitoring shall be conducted according to the procedures outlined in the National Institute of Occupational Safety and Health (NIOSH) monitoring method number 1500 or the equivalent (Attachment K). The SSO shall determine monitoring frequency based on work activities and site conditions; however, monitoring shall be conducted frequently enough to document levels of personnel exposure to benzene in accordance with the benzene standard (29 CFR 1910.68).

8.3 ACTION LEVELS

The following response levels will apply for all work on this Site:

Air Quality Measurement	Response
FID reading of sustained level (greater than 5 minutes) of 2 ppm in the breathing zone (BZ) or less;	Level D Protection
FID reading less than 10 ppm above background in the BZ (1 min average);	Level C Protection Obtain initial samples with benzene Draeger Tubes

Air Quality Measurement	Response
FID readings greater than 10 ppm above background in the BZ (1 min average);	Level B Protection
Benzene Draeger Tube readings greater than 0.5 ppm but less than 5 ppm in the BZ	Level C Protection Obtain integrated benzene samples
Benzene Draeger Tube readings greater than 5 ppm in the BZ	Level B Protection
Integrated sampling (NIOSH 1500) results greater than 0.5 ppm	Implement all aspects of the benzene standard 29 CFR 1910.1028
Dust generating activities.	Take action to suppress emissions such as misting/moistening soils. If soils can not be moistened, upgrade to Level C.

If monitoring results indicate that airborne concentrations as measured by the OVA are below the Level C action level, personnel may remove their respirator (except during Task 1E). Saranex (or splash suit) may be removed while in the exclusion zone only after visible signs of sediment are rinsed or wiped off the Saranex (or splash suit) and boots and, there is no longer a reasonable potential for contact with river sediment.

8.4 WORK ZONES

The work zones at the Site will include the following:

Zone 1: Exclusion Zone
Zone 2: Decontamination Zone
Zone 3: Support Zone

The exclusion zone is the zone where contamination does or could occur. For the field activities covered in Section 5.0, the exclusion zone will include all of the boats used during field activities,

and the entire sample processing area. In addition, the exclusion zone at the 80/120 Lister Avenue properties is shown in Figure 8-1.

All persons entering the exclusion zone must wear the personal protective equipment set forth in Section 8.1 and 8.3. The exclusion zone in the sample processing area and on 80/120 Lister will be delineated by the use of warning tape, snow (Hunter's orange) fence and/or traffic cones in addition to posting signs. Entrance into the exclusion zone on the boats and at 80/120 Lister is via the decontamination zone.

Between the exclusion zone and support zone is the decontamination zone which provides a transition zone between the contaminated and clean areas of the Site. The decontamination zones for activities on the 80/120 Lister Avenue properties and for field activities on the Passaic River will be different. Both decontamination zones are shown in Figure 8-1. All personnel must decontaminate when leaving the exclusion zone.

8.5 DECONTAMINATION PROCEDURES

8.5.1 Personnel Decontamination Procedures

- For work activities conducted on boats, personnel shall exit the boat onto the floating dock adjacent to the 120 Lister site. Decontamination shall be conducted in the Passaic River Decontamination Zone as shown in Figure 8-1.

- Following sample processing activities, personnel will decontaminate in the 80/120 Lister decontamination area shown in Figure 8-1.

- All persons leaving the exclusion zone shall pass through the decontamination zone to remove protective clothing and then through the personnel unit to shower before donning their street clothing. No contaminated clothing will be worn beyond the decontamination or the exclusion zones.

- All employees shall be instructed to shower in the personnel unit at the end of the work shift.

- An area shall be designated as the break area by the SSO. Personnel returning from the exclusion zone should complete decontamination stations 1 through 7 before entering break area. Personnel shall also wash their faces and hands.

- If there is a rip or tear in an employee's protective clothing and if there was contact with potentially contaminated material, the employee shall return to the decontamination zone as soon as possible, wash the affected skin area, and report the incident to the SSO. The SSO will then determine and authorize, if appropriate, the employee is to don new protective clothing (or to tape small rips or tears) and return to the work area. All exposed skin is to be washed at the decontamination zone boot wash before showering.

- The SSO shall monitor the effectiveness of the decontamination procedures and, if found ineffective, shall take appropriate steps to correct any deficiencies.

- It must be understood that the decontamination process is flexible. Changes occur on Site which can easily be overlooked during planning stages. The SSO should always be prepared to alter (add or delete a step or process) the decontamination sequence or equipment. Extra decontamination equipment (spares) as well as a local supplier should be readily available for items such as brushes, rags, soap, buckets, hoses, etc.

- The main thing to remember concerning modification of the decontamination sequence is to thoroughly and safely decontaminate regardless of the changes. Actions must be taken to minimize the contamination in the decontamination zone and eliminate any contamination in the support zone and off-Site areas. At all times, minimize contact between potentially contaminated material and clean

material (e.g., do not touch yourself without thoroughly washing at the break area).

- Personnel decontamination procedures to be used in case of an emergency are described in Section 9.5.2.

8.5.1.1 Decontamination Stations

The following steps must be taken as applicable to the PPE in use for personnel decontamination when leaving the exclusion zone (subject to modification by SSO):

Station 1: Segregated Equipment Drop

Task: Deposit all equipment used on Site onto/into plastic sheeting or plastic lined containers. Place on table or pass to decontamination line assistant.

Equipment:
1. Various sized containers
2. Plastic drum liners (4 to 6 mil)
3. Plastic sheeting

Station 2: Outer Protective Clothing Wash

Task: Scrub boots thoroughly with wash solution and scrub brushes.

Equipment:
1. Wash tubs
2. Detergent/water solution (example: trisodium phosphate)
3. Garden hose and pressure reducing nozzles (to minimize overspray contamination) or water sprayer
4. Long handled soft bristle scrub brushes